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WebQuests: Are They Developmentally Appropriate?

by Cleborne D. Maddux and Rhoda Cummings

Abstract

A topic that currently is receiving a great deal of attention by educators is the nature and use of WebQuests—computer-based activities that guide student learning through use of the World Wide Web (Sharp 2004). Despite their popularity, questions remain about the effectiveness with which WebQuests are being used with students. This article describes WebQuests and their use in the public schools, identifies cautions and concerns about the developmental appropriateness of WebQuests, and describes their potentially effective uses.

A WebQuest is an inquiry-oriented activity in which most or all of the information used by learners is drawn from the Web. WebQuests are designed to use learners' time well, to focus on using information rather than looking for it, and to support learners' thinking at the levels of analysis, synthesis, and evaluation (Dodge 2005).

WebQuests were first modeled in 1995 by Bernie Dodge and Tom March as one strategy for effectively integrating the Web into classroom instruction (March 2005). Then, in a 1997 article entitled "Some Thoughts about WebQuests," Dodge described these instructional activities in greater detail and identified six critical attributes of a WebQuest:

1. An introduction that sets the stage and provides some background information.
2. A task that is doable and interesting.
3. A set of information sources needed to complete the task. Many (though not necessarily all) of the resources are embedded in the WebQuest document itself

as anchors pointing to information on the World Wide Web. Information sources might include Web documents, experts available via e-mail or real-time conferencing, searchable databases on the Net, and books and other documents physically available in the learner's setting. Because pointers to resources are included, the learner is not left to wander through Web space completely adrift.

4. A description of the process the learners should go through in accomplishing the task. The process should be broken out into clearly described steps.
5. Some guidance on how to organize the information acquired. This can take the form of guiding questions or directions to complete organizational frameworks such as timelines, concept maps, or cause-and-effect diagrams.
6. A conclusion that brings closure to the quest, reminds the learners about what they've learned, and perhaps encourages them to extend the experience into other domains.

Since 1997, the number of sites dealing with WebQuests has increased dramatically. One measure of the popularity of WebQuests is a recent Google™ search (www.google.com) using the search string "webquest" that resulted in more than 1 million Web sites that mention the topic! Even more remarkable than the number of WebQuest sites is the fact that nearly all of the attention in the professional literature has been positive in nature. A brief scan of the first 1,000 Google hits, as well as an informal review of current introductory textbooks on information technology in education, revealed that nearly everyone writing about WebQuests is highly supportive of their use.

Given this overwhelmingly universal enthusiasm, a degree of caution may be prudent. An objective discussion and analysis of WebQuests may be useful, with an eye toward determining their general educational value, as well as their efficacy in specific educational situations and levels.

Underlying Assumptions about WebQuests

Dodge (1997) asserted that WebQuests can be either short-term or long-term in nature. Short-term WebQuests (to be completed in one to three class periods) have a goal of "knowledge acquisition and integration" by requiring that students "grapple with a significant amount of new information and make sense of it" (Dodge 1997). In this statement is an explicit, underlying assumption that students are capable of acquiring and understanding new information presented in this manner. Also evident is an implicit, underlying value judgment that knowledge acquisition and understanding are valuable and important. Though this seems quite reasonable, one might be tempted to split hairs and argue that specifying both knowledge acquisition and knowledge understanding is redundant, because knowledge without understanding hardly can be considered knowledge, much less knowledge acquisition.

A more substantive criticism is that the goals of short-term WebQuests do not seem consistent with Dodge's (2005) general definition of WebQuests. His definition, cited at the beginning of this article, states, "WebQuests are designed to use learners' time well, to focus on using information rather than looking for it, and to support learners' thinking at the levels of analysis, synthesis, and evaluation" (Dodge 2005). However, in Dodge's

(1997) definition of short-term WebQuests, the learner is focused entirely on looking for information, with no time spent on analysis, synthesis, and evaluation. Therefore, what Dodge has termed short-term WebQuests seemingly are not true WebQuests at all, but rather exercises intended to teach less sophisticated skills that may be prerequisite to true, long-term WebQuests.

Long-term WebQuests—to be completed in a week to a month—have a goal of “extending and refining knowledge” (Dodge 1997). Dodge (1997) added that in completing a long-term WebQuest, “A learner would have analyzed a body of knowledge deeply, transformed it in some way, and demonstrated an understanding of the material by creating something that others can respond to, on-line or off-.” Thus, a long-term WebQuest appears to be a true WebQuest because it conforms to Dodge’s (2005) definition that WebQuests “support learners’ thinking at the levels of analysis, synthesis, and evaluation.”

The lack of precision in the language used to define short-term and long-term WebQuests, as well as a discrepancy between the general definition of WebQuests and the specific definition of short-term WebQuests, are problematic. However, these problems are relatively trivial and unlikely to influence practitioners who are considering using WebQuests in their classrooms. Nevertheless, they do call attention to some incomplete or imprecise thinking in the conceptualization of WebQuests, prompting the question of whether other problems exist that may be more substantive in nature.

Issues of Development and Individual Differences

A much more difficult and potentially controversial problem with WebQuests is one that pervades education in general—that is, determining how our understanding of human and cognitive development should influence educational practice. With regard to WebQuests, this problem becomes apparent when Dodge’s (2005) general definition is reexamined.

An implicit assumption underlying Dodge’s (2005) definition is that typical students using WebQuests are capable of inquiry-oriented activity—some components of which are analysis, synthesis, and evaluation. These assumptions would be less suspect if WebQuests were being offered primarily to secondary-school students—at least some of whom have developed the capacity for these advanced cognitive abilities. However, a quick review of some of the thousands of Web sites devoted to WebQuests revealed that WebQuests are being suggested for use at all grade levels, including very young children.

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Of course, a difference between how developers of any educational method or tool intend for that method or tool to be used and how practitioners actually use it always exists. However, Dodge himself, in a *Tapped In* (SRI 2003) discussion, advised that WebQuests are appropriate for children as young as those in the third grade, and added, “there are some good ones that go lower.” Other writers are even less circumspect in identifying the age or grade range for which WebQuests are appropriate. For example, Andrews (1999), in an entry in the online *Encyclopedia of Educational Technology*, stated, “WebQuests, however, may be used in any subject at any level, from first grade through college.”

In his six critical attributes of WebQuests, Dodge (1997) did not provide WebQuest developers with any direction regarding the need to consider their students’ cognitive development. The omission of such direction may lead some educators to believe that the cognitive abilities of students should not be regarded when writing and using WebQuests. In yet another publication, “A Rubric for Evaluating WebQuests” (Bellofatto et al. 2001), Dodge and his colleagues included only one category that mentioned anything related to cognitive level. Ironically, that rubric category was titled “Cognitive Level of the Task” rather than “Cognitive Level of the Learner.” In fact, the rubric did not contain any category that would direct a WebQuest developer to consider any characteristics of learners, such as ages or cognitive abilities. Instead, the rubric focused entirely on the characteristics of the WebQuest, which does nothing to ensure a match between WebQuest cognitive demands and learner characteristics, cognitive or otherwise.

This lack of concern with the learner is the major weakness of the WebQuest approach. Because of this omission, many WebQuests are identical in their goals, methods, and task requirements, regardless of the age of the students and without regard for any other learner characteristics. This approach is akin to having all students read books or solve arithmetic problems without taking into account learner differences.

What Do WebQuests Teach?

This is an interesting question, and one well worth considering. A WebQuest, as defined by Dodge (2005), cannot teach anything in particular nor do anything more than provide experience in using the Web to find information. More may be taught and learned with a WebQuest, but whether or not that happens depends on the content of the WebQuest, the skill with which it is written and used by teachers, and the motivation and abilities of the students. The same is true of any teaching method, technique, or activity.

Though Dodge (2005) defined a WebQuest as an inquiry-oriented activity, a WebQuest could be described more accurately as a lesson plan format—the effectiveness of which is totally dependent on a variety of teaching and learning variables. In and of itself, this attribute is not necessarily a weakness, but may be responsible for another problem related to WebQuests: Teachers may believe that the mere use of a WebQuest ensures that certain specific skills are being taught or that certain teaching techniques are being applied regardless of the WebQuest content, the way WebQuests are used, and the individual differences and cognitive developmental levels of students. Dodge’s statements, which he made in a *Tapped In* discussion (SRI 2003), may have inadvertently contributed to this misconception:

The WebQuest model didn't fall out of the sky from the planet Krypton. It's just a particular packaging of concepts and techniques like cooperative learning, advanced organizers, scaffolding, problem-based learning, and so on . . . each of which has a huge literature base. So, when it comes time to do a lit review in preparation for a WebQuest study, you construct it based on whatever aspects of WebQuests that you're interested in.

Simply because a lesson is cast in a WebQuest format is no guarantee that the lesson makes use of cooperative learning, advanced organizers, scaffolding, or problem-based learning, nor does it guarantee that these concepts and techniques are effectively, or even merely competently, applied in a way that is consistent with the "huge literature base" underlying each of them.

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WebQuests must be carefully designed, and teachers must evaluate the content of each WebQuest to ensure its consistency with the students' characteristics who are using it. Again, the same could be said for any teaching tool or technique. The difference is that, unlike the literature on other educational techniques and innovations, the literature on WebQuests seldom mentions anything about the importance of considering the developmental levels or individual differences of students.

Why Are WebQuests So Popular?

Surprisingly, many teachers uncritically have bought into the WebQuest approach even though they are well aware that third graders cannot be taught using the same goals and methods as those used when teaching middle or high school students. Teachers know that even within a single grade level, considerable variation exists in the developmental level of students. When developing teaching plans and choosing student activities, teachers generally are cognizant of the importance of considering both the developmental levels and individual differences of students.

Why then have teachers been so quick to endorse the WebQuest approach? The reasons for the nearly universal and largely uncritical acceptance of WebQuests are multiple and complex. One reason may have less to do with the quality or efficacy of WebQuests than with the striking lack of attractiveness of other methods and techniques for using information technology in schools. The field of information technology in education has offered little in the way of proven, effective, and practical techniques for using the Web with students; therefore, WebQuests may appear more innovative and promising than they otherwise might seem. After all, WebQuests do provide a highly structured format by which teachers can easily and quickly design a lesson in which, in even the poorest WebQuest implementations, some students will gain experience in finding information on the World Wide Web.

Though the Web has grown phenomenally in size and popularity, educators have only begun to find ways to exploit its considerable teaching and learning potential. Given the embryonic nature of what is available on the Web and schools' difficulties in establishing inexpensive and reliable classroom Internet connectivity and in acquiring and maintain-

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ing classroom-based computers, this delay is understandable. The Web's interactive capability may have the potential to revolutionize teaching and learning, but it has not yet done so. In fact, with certain notable exceptions, the vast majority of pages do not make meaningful use of the Web's interactive potential. Consequently, the Web is currently little more than a huge collection of unorganized information, the content of which ranges from the ridiculous to the sublime. Not surprisingly, teachers who have sought a formalized and systemic way to make classroom use of the World Wide Web have embraced the WebQuest concept.

Another reason for the popularity of WebQuests is that many WebQuest advocates have linked WebQuests to constructivism, a pedagogical approach that has achieved near-religious acceptance and regard among many educators. The WebQuest approach—which makes little or no provision for a learner's cognitive development—is often said to be a constructivist approach or technique.

The logical inconsistency of claiming that an approach which ignores development is constructivist in nature results from educators' widespread misunderstanding of Piaget (1952) and Vygotsky (1978), two theorists who devoted their careers to understanding and explaining human cognitive development and whose work is most often cited as the basis of constructivism (Maddux and Cummings 1999). This misunderstanding is a result of many factors, not least of which is that Piaget and Vygotsky wrote in French and Russian, respectively, thus forcing educators to read translations rather than the work itself. The work of both men is complex and difficult to understand.

Clearly, many educators who claim to be constructivists have not bothered to read the thorough translations of Piaget's and Vygotsky's work. Their unfamiliarity with these two theorists is evident in false statements they make or in comparisons that are completely unsupported by facts. For example, the suggestion that Vygotsky somehow disproved Piaget's ideas is ludicrous for a number of reasons. First, Vygotsky was familiar only with Piaget's early work. Though the two were born in the same year—1896—Vygotsky died prematurely in 1934 at age 38, while Piaget continued to work and to modify his ideas until 1980, when he died at the age of 84. Furthermore, though the two disagreed on some aspects of the relationship between thought and language, their work has many points

of agreement (Maddux and Cummings 1999). Kohlberg and Wertsch (1987, 219) agreed with this conclusion: "Overall, we see Piaget and Vygotsky as presenting approaches that complement one another."

Perhaps the major difference between the two theorists was captured by Wink and Putney (2002): Piaget posited that individuals must achieve a certain level of cognitive development before certain learning could occur, while Vygotsky directed his attention not only to the actual level of development, but also to the potential level. In addition, Wink and Putney (2002, 23) stated, "for Vygotsky, learning first, and then development. For Piaget, development first, and then learning."

Educators have suggested that Piaget did not believe that social factors play a role in development. Piaget's writings, however, are full of references to the importance of social relations in the child's cognitive development. For example, in *Sociological Studies* (1995, 120), Piaget stated, "social life is a necessary condition for the development of logic." Furthermore, DeVries (1997; 2000) and her colleague Zan (DeVries and Zan 1992) have written extensively about the importance of social relations in Piaget's theories and have provided many direct quotations from his work to emphasize this point. In *The Moral Judgment of the Child* (1965), Piaget consistently emphasized the necessity of social interactions between adults and peers for decreasing egocentricity and moving children forward in both intellectual and moral reasoning.

Similarly, a common misconception about Vygotsky is that he did not subscribe to the existence of developmental levels and believed that a child of any age is capable of the highest level of adult thinking given the proper support—or *scaffolding* (a term that often is erroneously attributed to Vygotsky, but was probably first used by Wood, Bruner, and Ross in 1976). Contrast this assertion with the following direct quotation from *Mind in Society* (1978, 86), in which Vygotsky discussed his assertion that children at any particular developmental level are not bound to operate only at that level at all times.

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This difference between twelve and eight, or between nine and eight, is what we call the zone of proximal development. It is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers.

His use of the term "developmental level" indicates that he was not implying that anyone can operate at any level under the right circumstances. The zone of proximal development for any given child was certainly not posited by Vygotsky to span all levels, and clearly

the distance that might be spanned is conceived as highly variable from individual to individual.

Furthermore, in *Thought and Language* (1986, 106–10), Vygotsky asserted:

The development of the processes that eventually result in concept formation begins in earliest childhood, but the intellectual function that is a specific combination for the psychological basis of the process of concept formation ripens, takes shape, and develops only at puberty. . . . Our investigation brought out that the ascent to concept formation is made in three basic phases, each divided in turn into several stages.

So, why are many educators willing to accept the idea that individual development and other discrete differences are irrelevant to thinking and problem solving and are influenced only by social factors and scaffolding? Arieievitch (2003) suggested that such thinking is consistent with powerful, currently popular trends in psychology. He (2003, 283) identified a need in psychology for an “understanding of mental processes in a nonmentalist way, and of individuals in a nonindividualistic way—without throwing individual cognition away all together.” He added, “That is exactly what, in my view, has become one of the main difficulties in some important trends of today’s psychology—within sociocultural psychology and beyond it, especially in cognitive psychology.”

The importance of social factors in thinking and learning has been overemphasized, and the importance of development has been underemphasized. Perhaps this trend is merely the latest iteration of a long-standing cycle in education in which the importance of heredity and environment are alternately overemphasized with regard to a host of human outcomes. This cycle has recurred quite clearly over the past 100 years as social scientists have debated the relative influence of heredity and environment in the development of intelligence. Currently, the pendulum in education seems to be at the extreme end of the continuum, at which point environmental factors are emphasized to the near exclusion of other factors such as development. The cycle seems to be at a point in which many educators are willing to make use of tools such as WebQuests in a way that is consistent with what Arieievitch (2003, 283) referred to as “throwing individual cognition away all together.”

What Is Meant by Developmentally Appropriate?

Though some weaknesses of the WebQuest concept were discussed in this article, the authors do not advocate the abandonment of WebQuests by teachers. Rather, care should be taken to ensure that teachers who develop and use WebQuests are mindful of students’ individual differences including, but not limited to, age, grade, and cognitive developmental level. To remind teachers of the importance of these considerations, Dodge’s (1997) second item in his list of WebQuests’s critical attributes should be modified from “a task that is doable and interesting” to “a task that is doable, interesting, and appropriate to the developmental level and other individual differences of students with whom the WebQuest will be used.”

Though easy to advocate for the developmental appropriateness of tasks, specify-

ing exactly what is or is not developmentally appropriate for a given child is more difficult. In 1997, the National Association for the Education of Young Children published a position statement on developmentally appropriate practices for children from birth through age eight. Though the Association did not endorse any specific curricula, and the guidelines have been criticized on several grounds, including lack of specificity, the general recommendations concerning curricula are admirable. The guidelines stated that any curriculum should be developmentally appropriate and should include “a broad range of content across disciplines that is socially relevant, intellectually engaging, and personally meaningful to children” (NAEYC 1997). The guidelines also suggested that curriculum goals should be realistic and attainable for most children in the designated age range for which they are designed. Glasenapp (2005), in discussing the guidelines, stated that ensuring developmental appropriateness requires consideration of three, interrelated dimensions:

- Age appropriateness, which is based on the knowledge of typical development of children.
- Social and cultural appropriateness, which requires providing learning experiences that are meaningful, relevant, and respectful.
- Individual appropriateness, which is based on an understanding of individual children’s growth patterns, strengths, interests, and experiences.

Too often, those advocating the use of WebQuests seem concerned with only one of these dimensions—that of social and cultural appropriateness. Furthermore, the dimension of age appropriateness appears to be the most neglected, resulting in WebQuests that look identical for use across a broad range of ages, grades, and individual differences.

Appropriate WebQuests and Other Teaching and Learning Tools

In terms of age appropriateness, Piagetian theory and stages of cognition provide a useful starting point in determining what types of tasks are practical to incorporate in a WebQuest for a group of students. Further refinement should come from careful consideration of social, cultural, and individual appropriateness.

As mentioned previously, many of the translations and summaries of Piaget’s theories are difficult to comprehend. To help in this effort, the authors recommend several well-written secondary sources that are available in nearly every library, such as Furth and Wachs (1975), Ginsburg and Oppen (1988), Labinowicz (1980), and Wadsworth (2004). A revised version of two lectures on Piaget by Robert L. Campbell of Clemson University (2006), available on the Web, is also recommended.

In deciding which specific tasks should be included in a WebQuest, Vygotsky’s concept of the zone of proximal development is extremely helpful. Once the developer of a WebQuest tentatively decides on the age appropriateness of the included tasks, he or she should modify or enhance these tasks by making provisions for the zone of proximal development—or the level of difficulty that will be reasonable for students given proper scaffolding techniques. One of the best secondary sources for Vygotsky’s ideas is *A Vision of Vygotsky* (2002) by Wink and Putney. Chapter four of that book, which deals with the

zone of proximal development, is particularly good. Elkind (1994) also does a good job of combining the ideas of Piaget and Vygotsky. For a more complete understanding of scaffolding, the generally agreed upon primary source for the concept is an article by Wood et al. (1976), "The Role of Tutoring in Problem Solving." An article by Sherin, Reiser, and Edelson (2004) also is helpful.

Other concepts or techniques often attributed to WebQuests also should be studied. As Dodge (SRI 2003) pointed out, extensive literature is available on cooperative learning, advanced organizers, and problem-based learning—concepts or techniques often mentioned as implicit in WebQuests. WebQuest developers interested in making productive use of these concepts or techniques should be familiar with the primary sources that comprise the most important part of this literature.

Conclusion

Advocacy literature about WebQuests neglects some of the problems associated with this increasingly popular teaching technique. The language used in defining WebQuests often is general and imprecise. More seriously, many WebQuests ignore developmental levels and other individual differences of students. Consequently, many WebQuests seem identical in goals and techniques regardless of the ages, developmental levels, or individual differences of the children for whom they are intended. Hopefully, the suggestions made in this article will be of value in improving developmental appropriateness in future WebQuests.

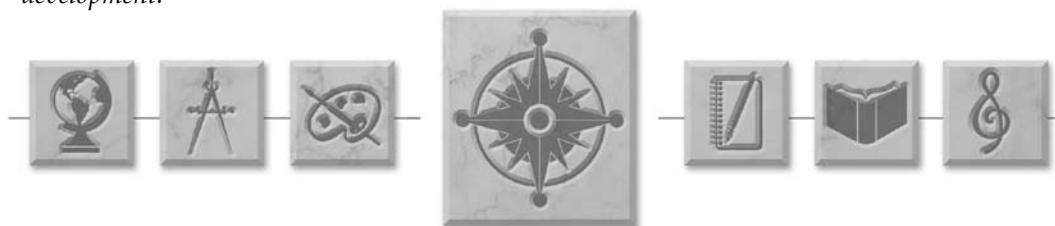
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